

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/KR2004/002265**A. CLASSIFICATION OF SUBJECT MATTER****IPC7 F23N 5/02**

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC7 F23N 5/02; F03G 7/06; F16K 17/02, 17/38, 31/122, 31/126, 31/64, 31/68; F22G 5/04; F22D5/08

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Patents and applications for inventions since 1975

Korean Utility models and applications for Utility models since 1975

Japanese Utility models and application for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 55813 A (SASSERATH & CO KG H) 14 July 1982 See the abstract; figure	1, 2
Y	JP 64-024177 A (HASHIGUCHI HAJIME) 26 January 1989 See the whole document	1, 2
A	US 3756083 A (TOYO KOGYO CO.) 4 September 1973 See the whole document	1, 2

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

22 FEBRUARY 2005 (22.02.2005)

Date of mailing of the international search report

24 FEBRUARY 2005 (24.02.2005)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office  
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PARK, HYUN SOO

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## INTERNATIONAL SEARCH REPORT

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### Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 3 - 10  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  
See the Supplemental Box
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

The application does not meet the requirement for the unity of invention set forth in PCT Articles 3(4)(iii), 34(3) and Rule 13.1. It is immediately evident "a priori" that the independent claims relate to two different problems and have little in common.

Claimed invention (i): claims 1 and 2 are directed to a thermally operated valve.

Claimed invention (ii): claims 3-10 are directed to an automatic circulation device of warm water.

While it can be said that the claimed invention (i) is one of the special technical features of the claimed invention (ii), nevertheless, this does not provide a required novel concept in that the claimed invention is known from D1 and D2.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

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In continuation of Box No. II

Claims 3-10 are so unclear that no opinion could be formulated as to novelty or inventive step.

The problem with claims 3-10 is that the working of the automatic circulation device of said claims leaves the reader in doubt. According to the description, the water circulation of the device is caused by the vapor pressure created by heating of the boiler, and consequently no other pressurizing means is needed. However, there is much doubt whether the vapor pressure of the circulation pipes could be increased large enough to render the water circulate because it is described in the description that water in the boiler will not be heated up to 100°C by the function of the gas control valve. Since a specific volume of water does not increase much before boiling, the pressure rise in the boiler of the present invention would result in merely a slight change.

COPY FOR IB

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)



PCT/KR2004/002265

REC'D 17 AUG 2006

WIPO PCT

Applicant's or agent's file reference GAPCT1218	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. <b>PCT/KR2004/002265</b>	International filing date(day/month/year) <b>07 SEPTEMBER 2004 (07.09.2004)</b>	Priority date (day/month/year) 14 JANUARY 2004 (14.01.2004)	
International Patent Classification (IPC) or national classification and IPC  <b>F23N 5/02(2006.01)i</b>			
Applicant  <b>CNTEK, CORP. et al</b>			

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>7</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____ containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>	
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input checked="" type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input checked="" type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>	

Date of submission of the demand  <b>14 NOVEMBER 2005 (14.11.2005)</b>	Date of completion of this report  01 MAY 2006 (01.05.2006)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer  SONG, Jay Wook  Telephone No. 82-42-481-5487 

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☒ This report is based on translations from the original language into the following language English which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☒ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☒ the international application as originally filed/furnished
- ☐ the description:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the claims:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the drawings:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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## Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 3-10

because:

☐ the said international application, or the said claims Nos. \_\_\_\_\_  
relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 3-10  
are so unclear that no meaningful opinion could be formed (*specify*):

See the Supplemental Box.

☐ the claims, or said claims Nos. \_\_\_\_\_ are so inadequately supported  
by the description that no meaningful opinion could be formed (*specify*):

☐ no international search report has been established for said claims Nos. \_\_\_\_\_

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

☐ furnish a sequence listing on paper complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Preliminary Examining Authority in a form and manner acceptable to it.

☐ furnish a sequence listing in electronic form complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Preliminary Examining Authority in a form and manner acceptable to it.

☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13ter.1(a) or (b) and 13ter.2.

☐ a meaningful opinion could not be formed without the tables related to the sequence listings; the applicant did not, within the prescribed time limit, furnish such tables in electronic form complying with the technical requirements provided for in Annex C-bis of the Administrative Instructions, and such tables were not available to the International Preliminary Examining Authority in a form and manner acceptable to it.

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in electronic form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.

☐ See Supplemental Box for further details.



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Box No. IV Lack of unity of invention

1. ☐ In response to the invitation to restrict or pay additional fees the applicant has, within the applicable time limit:
- ☐ restricted the claims
  - ☐ paid additional fees
  - ☐ paid additional fees under protest and, where applicable, the protest fee
  - ☐ paid additional fees under protest but the applicable protest fee was not paid
  - ☐ neither restricted nor paid additional fees.
2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is :
- ☐ complied with.
  - ☒ not complied with for the following reasons:

The application does not meet the requirement for the unity of invention set forth in PCT Articles 3(4)(iii), 34(3) and Rule 13.1. It is immediately evident "a priori" that the independent claims relate to two different problems and have little in common.

Claimed invention (i): claims 1 and 2 are directed to a thermally operated valve.

Claimed invention (ii): claims 3-10 are directed to an automatic circulation device of warm water.

While it can be said that the claimed invention (i) is one of the special technical features of the claimed invention (ii), nevertheless, this does not provide a required novel concept in that the claimed invention is known from D1 and D2.

4. Consequently, this report has been established in respect of the following parts of the international application :

- ☐ all parts:
- ☐ the parts relating to claims Nos.

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## Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	1,2	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1,2	NO
Industrial applicability (IA)	Claims	1,2	YES
	Claims	None	NO

### 2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1: EP 55813 A  
D2: JP 64-24177 A

Claim 1 is directed to a gas flow rate control valve and claim 2 is directed to a gas flow open/close valve. However, the subject matters of claims 1 and 2 are very much the same in that the valves are thermally operated.

D1 discloses a thermally operated safety-valve for use in a hot-water heating installation, comprising a valve housing having an inlet, an outlet, a closing spring, a seal ring, and a temperature sensor of vapor pressure type.

D2 discloses a heat sensing cylinder-rod actuator comprising a cylinder, a spring, a rod and a volatile evaporating substance.

#### Novelty

None of the prior art documents D1 and D2 disclose a valve case having an expanded bottom part. Hence, the subject matters of claims 1 and 2 seem to be novel (PCT Article 33(2)).

#### Inventive Step

The valve case having the expanded part is considered to be a slight constructional change which comes within the scope of the customary practice followed by persons skilled in the art as the advantages thus achieved can readily be foreseen. Consequently, the subject matters of claim 1 and 2 lack an inventive step (PCT Article 33(3)).



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**Box No. VIII Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

It is understood from the description that a burning control means activated by the temperature of a boiler is essential for the automatic circulation of the present invention but it is not properly described in claim 3. Therefore, claim 3 does not meet the requirements of PCT Article 6 taken in combination with PCT Rule 6.3(b) that any independent claim must contain all the technical features essential to the definition of the invention.

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

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**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.  
Continuation of:

Box No. III

Claim 3-10 are so unclear that no opinion could be formulated as to novelty or inventive step. The problem is that the working of the automatic circulation device of claim 3-10 leaves the reader in doubt. According to the description, the water circulation of the device is caused by the vapor pressure created by heating of the boiler, so no other pressurizing means is needed. But, there is much doubt whether the vapor pressure of the circulation pipes could be increased large enough to render the water circulate because it is described in the description that water in the boiler won't be heated up to 100°C by the function of the gas control valve. Since, a specific volume of water doesn't increase much before boiling, the pressure rise in the boiler of the present invention would result in just a slight change.